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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.     | CONFIRMATION NO.       |
|---|-------------|----------------------|-------------------------|------------------------|
| 10/799,548  | 03/11/2004  | Kedar Shirali        | MP0432/13361-085001     | 7826                   |
| 26200 7590 02/04/2008<br>FISH & RICHARDSON P.C.<br>P.O BOX 1022<br>MINNEAPOLIS, MN 55440-1022 |             |                      | EXAMINER<br>JAIN, RAJ K |                        |
|   |             |                      | ART UNIT<br>2616        | PAPER NUMBER           |
|   |             |                      | MAIL DATE<br>02/04/2008 | DELIVERY MODE<br>PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/799,548

Applicant(s)

SHIRALI ET AL.

Examiner

Raj K. Jain

Art Unit

2616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11/30/07.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-87 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-87 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Objections***

Claims 1, 8, 16, 22, 28, 33, 39, 45, 52, 60, 67, 74 and 81 are objected to because of the following informalities: The subject claims recite "DC" all acronyms appearing for the first time either in an independent claim or its dependent claim must be spelled out at least once. Appropriate correction is required.

Claim 16 recites an apparatus claim however there is not device or structure that constitutes as an "apparatus". It is not clear from the drawings or specs what is a formatter as claimed to be an apparatus. Clarification is required.

Claim 29 is redundant as OFDM is already disclosed in claim 28, suggest deleting claim 29.

Claims 45 and 52 add "computer readable medium encoded with a" prior to "computer program". Furthermore, claims need to be rewritten that illustrate a computer instruction set being performed. For example in claim 45 a computer program does not "generate a pilot symbol structure", the computer program provides the instruction set, thus the claims are required to be structured accordingly.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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Claim 33 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The claim is a single means claim which is subject to an undue breadth and therefore rejected accordingly (see MPEP 2164.08a).

Claims 45-59 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. A Computer program and/or computer readable medium critical or essential to the practice of the invention, is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). Since the disclosure explicitly fails to recite the above subject matter within its specifications, it is not clear how the computer program is implemented based on either the specifications and/or drawings. Appropriate correction is required.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 4, 11, 19, 25, 31, 36, 42, 48, 55, 63, 70, 77 and 84 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is not clear from the drawings and/or specifications how are the pilot symbol structures defined as being first, second or third. Clarification is required.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1-4, 7-12, 15-19, 21-36, 38-48, 51-56, 59-63, 65, 67-72, 74-77, 79 and 81-86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al (US 2002/0003774 A1) in view of Webster et al (US 2005/0075815 A1).

Regarding claims 1, 8, 16, 22, 28, 33, 39, 45, 52, 60, 67, 74, and 81 Wang discloses an OFDM system (see abstract) comprising:

transmitting a pilot symbol structure including a first pilot symbol including pilot information on a first plurality of alternate tones (see abstract, paras 1, 4, 8 and 12, orthogonal pilot symbols are transmitted from the OFDM system grid).

a second pilot symbol including pilot information on a second plurality of alternate tones, wherein the tones in the second plurality of alternate tones and the first plurality of alternate tones are on opposite sides (Figs 3 and 4, and paras 12, 14, 31 and 32, Fig. 4A shows second pilot symbols that are alternating and identical and orthogonal to the corresponding first pilot symbols of the pilot symbol pattern in Fig. 3A., see para 31 for further details).

Wang fails to disclose a DC offset that places pilot symbols at equidistant from the DC tone.

Webster discloses a DC offset that places pilot symbols at equidistant from the DC tone (Paras 4, 8, 38 and 45). Equidistant DC offset of pilot symbols allows for a quality transmission of points whereby the points can be more closely spaced, when the signal noise is low and when there are small changes of the channel characteristics along the transmission path, without occurring a blurring of the points by the transmission in a way that can lead to a misallocation at the time of decoding. Thus it would have been obvious at the time the invention was made to incorporate the teachings of Webster within Wang so as to improve the signal resolution being transmitted and/or received amongst appropriate transceivers.

Regarding claims 2, 9, 17, 23, 29, 34, 40, 46, 53, 61, 68, 75 and 82 Wang discloses an OFDM system (see abstract).

Regarding claims 3, 10, 18, 24, 30, 35, 41, 47, 54, 62, 69, 76 and 83 Wang discloses wherein the pilot symbol structure further includes a third pilot symbol, the third pilot symbol being identical to the first pilot symbol (Paras 31 Fig. 3A and 4A, third pilot symbol 44 is identical to 22 in Fig. 3A).

Regarding claim(s) 4, 11, 19, 25, 31, 36, 42, 48, 55, 63, 70, 77 and 84, Wang discloses a third symbol say 43 (Fig. 4A) in between first symbol 42 and second symbol 44.

Regarding claim(s) 7, 15, 21, 27, 32, 38, 44, 51, 59, 65, 72, 79 and 86, Webster discloses a DC offset or null tones with no pilot information (Paras 4, 8, 38 and 45).  
Reasons for combining same as for base claims above.

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Regarding claim(s) 12, 26, 43, 56, 71 and 85 Webster discloses a DC offset frequency estimation using various configurations (para 8 ), one skilled in the art will appreciate that the list of configurations is not exhaustive and one can easily estimate first and third symbols if so desired. Reasons for combining same as for base claims.

Claims 5, 6, 13, 14, 20, 37, 49, 50, 57, 58, 64, 66, 73, 78, 80 and 87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al (US 2002/0003774 A1) in view of Webster et al (US 2005/0075815 A1) further in view of Shoemake et al (US 2003/0231715 A1). Wang fails to disclose an OFDM system transmission within an MIMO, MISO, SISO or 802.11n system.

Shoemake discloses an OFDM system transmission within an MIMO, MISO, SISO or 802.11n system (see paras 8, 26, 28 and 47). The use of multi-channel modulation schemes allows for optimizing wireless communications in concert with wireline networks that employ different tones for channel characterization. Shoemake further discloses channel estimation on valid data to be transmitted otherwise data may not be transmitted for non valid tones (see para 41). Thus it would have been obvious at the time the invention was made to incorporate the teachings of Shoemake within Wang so as to improve network performance by providing an efficient and seamless connection for different systems and/or standards.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-87 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raj K. Jain whose telephone number is 571-272-3145. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on 571-272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

January 29, 2008

***Raj K. Jain***  
***/Raj K. Jain/***  
***Art Unit 2616***